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COTTON GIN OPERATING COSTS IN WEST TEXAS 1970-71

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ABSTRACT

Average operating costs per bale of 42 West Texas gins for the 1970-71 season were: out-of-pocket--\$20.01, down \$1.65 or 7.6 percent from the 1969-70 season; total--\$24.07, down \$2.82 or 10.5 percent; and total standardized--\$26.82, down \$2.66 or 9 percent. The plants, grouped by rated hourly capacity, ginned 16 percent of the total West Texas cotton crop. Compared with 1969-70, ginning volumes were up and costs down from all gin size groups. The average ginning volume for all groups increased 22 percent for the season, while the average rate of gin plant capacity use was up 9 percentage points--from 39 to 48 percent.

Keywords: Cotton, ginning, costs, capacity, utilization.

PREFACE

This is the fifth annual report of cotton gin operating costs based on a sample of West Texas gins. Previous reports are:

Cotton Gin Operating Costs in West Texas, U.S. Dept. Agr., MRR-831, Nov. 1968.

Cotton Gin Operating Costs in West Texas, 1966-67 and 1967-68, U.S. Dept. Agr., MRR-844, Mar. 1969.

Cotton Gin Operating Costs in West Texas--1968-69, U.S. Dept. Agr., MRR-903, Sept. 1970.

Cotton Gin Operating Costs in West Texas--1969-70, U.S. Dept. Agr., MRR-934, Aug. 1971.

Objectives of the research are to (1) determine the current costs of ginning on the High Plains of West Texas and observe trends over time, (2) analyze the effects of changes in ginning volumes on ginning costs, and (3) consider the possibilities of reducing operating costs through more efficient ginning.

Gin cost information and records are mailed in annually for use in preparing these reports. The authors express their appreciation to the gin owners, and accountants for their continued support and assistance in this

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COTTON GIN OPERATING COSTS IN WEST TEXAS--1970-71
by

Dale L. Shaw and Charles A. Wilmot
Agricultural Economists
Marketing Economics Division

INTRODUCTION

This report, although condensed, retains the same basic format as that for the 1969-70 season (see preface). The rates used to calculate standardized depreciation and interest costs were changed to more accurately reflect actual interest and depreciation rates. They are discussed in the appendix under costing methods.

The gin sample is stratified into four groups, based on rated hourly capacities of the gin stand complexes. These are: group 1--8 bales or less; group 2--9 to 11 bales; group 3--12 to 20 bales; and group 4--21 bales or more. Size and content of the gin sample vary slightly from year to year, mainly because of periodic plant modifications which frequently alter capacity. This necessitates an annual review and reclassification of some plants into other size groups and the filling of voids thus created. During the 1970-71 season, the 42 plants in the sample ginned a total of 254,789 bales--16.0 percent of the total ginnings for the West Texas area.

FINDINGS

Volumes ginned.--Average volumes ginned were up this season, resulting in higher rates of gin plant capacity utilization, 1/ and lower per bale operating costs. Compared with last season, volumes in 1970-71 ranged from 10 percent higher for group 1 plants to 53 percent higher for group 2 plants; for all groups combined, average volume increased 22 percent (table 1). Larger ginning volumes resulted in higher rates of ginning capacity utilization in each size group. The gin capacity utilization rate for all groups combined increased 9 percentage points over last year--to 48 percent--the highest level since the 1965-66 season when the all-group average was 65 percent.

Costs per bale at actual percentages of capacity utilization.--Total sample gin costs 2/ per bale were down in 1970-71 from 1969-70 for all size groups

1/ Ratio of volume ginned to estimated total seasonal ginning capacity without seed-cotton storage. Based on typical ginning season of 906 operating hours and a sustained seasonal ginning rate capability set at 85 percent of rated capacity.

2/ Taken from gin records and submitted to uniform allocation procedures as outlined in the appendix.

Table 1.--Rated hourly capacities, volumes ginned, and capacity utilization, by ranges and averages, sample gin plants, West Texas, 1969-70 and 1970-71 seasons

| Gin size group: by season | Rated hourly capacity 1/ | | Annual volume ginned | | Rate of capacity utilization 2/ | |
|------------------------------|-----------------------------|---------|-------------------------|---------|------------------------------------|---------|
| | Range | Average | Range | Average | Range | Average |
| | Bales | | | | Percent | |
| 1969-70: | | | | | | |
| Group 1..... | 7 - 8 | 7.6 | 1,135- 5,193 | 3,107 | 18 - 84 | 53 |
| Group 2..... | 9 - 11 | 9.1 | 1,123- 4,188 | 2,294 | 16 - 60 | 33 |
| Group 3..... | 12 - 20 | 16.2 | 1,595-11,613 | 5,179 | 12 - 86 | 42 |
| Group 4..... | 21 - 60 | 32.4 | 3,464-13,991 | 9,123 | 14 - 77 | 37 |
| Combined... | 7 - 60 | 16.5 | 1,123-13,991 | 4,987 | 12 - 84 | 39 |
| 1970-71: | | | | | | |
| Group 1..... | 7 - 8 | 7.6 | 1,727- 5,659 | 3,430 | 28 - 92 | 59 |
| Group 2..... | 9 - 11 | 9.2 | 1,957- 5,203 | 3,517 | 28 - 69 | 50 |
| Group 3..... | 12 - 20 | 15.8 | 2,180-13,400 | 6,093 | 20 -109 | 50 |
| Group 4..... | 21 - 60 | 32.7 | 3,078-15,444 | 10,954 | 12 - 81 | 44 |
| Combined... | 7 - 60 | 16.5 | 1,727-15,444 | 6,066 | 12 -109 | 48 |

1/ Based on observations and manufacturers' ratings of gin stand complexes. Variations in group average between seasons are due to sample gin plant modifications which altered rated capacity and size group classifications.

2/ Ratio of volume ginned to estimated total seasonal ginning capacity without seed cotton storage. Based on typical ginning season of 906 operating hours and a sustained seasonal ginning rate capability set at 85 percent of rated capacity.

(tables 2 and 3). For all groups combined, the average was \$24.07 per bale, a decrease of \$2.82 from last season. 3/ Group 2, which showed the greatest increase in average rate of capacity utilization over last year, also showed the greatest reduction in average total cost--from \$29.27 to \$23.29 per bale.

Standardized sample gin cost 4/ averages ranged from \$26.19 for group 4 to \$28.63 for group 1, with an average cost of \$26.82 per bale for all groups combined. Last year, this cost range was \$27.82 for group 4 to \$33.70 for group 2; the average for all groups combined was \$29.48 per bale.

Out-of-pocket costs ranged from \$18.02 per bale for group 4 to \$22.70 for group 1. The average for all four groups combined was \$20.01 per bale. Compared

3/ See weighting procedure in appendix.

4/ See costing methods in appendix.

Table 3.--Sample gin costs per bale, by ranges and averages, groups 1-4 and all groups combined, 1/ West Texas, 1970-71 season

| Cost items 2/ | Group 1 | | Group 2 | | Group 3 | | Group 4 | | All groups combined | |
|-----------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|---------------------|---------|
| | Range 3/ | Average | Range 3/ | Average | Range 3/ | Average | Range 3/ | Average | Range 3/ | Average |
| Dollars | | | | | | | | | | |
| Management..... | 1.68- 9.84 | 3.73 | 2.64- 5.59 | 3.72 | 1.81- 5.08 | 2.77 | .99- 5.04 | 2.17 | .99- 9.84 | 3.09 |
| Insurance..... | .18- .78 | .40 | .22- .51 | .33 | .20- .77 | .39 | .14- .89 | .30 | .14- .89 | .36 |
| Taxes..... | .13- .90 | .41 | .20- .76 | .41 | .13- .80 | .27 | .10- 1.26 | .38 | .10- 1.26 | .36 |
| Energy..... | 1.28- 2.55 | 1.88 | .73- 3.72 | 1.70 | 1.51- 3.20 | 2.04 | 1.26- 2.92 | 1.91 | .73- 3.72 | 1.89 |
| Labor..... | 4.49- 6.97 | 5.96 | 3.70- 6.79 | 4.57 | 3.29- 6.35 | 4.31 | 3.13- 4.94 | 4.22 | 3.13- 6.97 | 4.72 |
| Bagging and ties..... | 2.66- 3.14 | 2.96 | 2.56- 3.27 | 2.92 | 2.69- 3.24 | 3.09 | 2.81- 3.19 | 3.07 | 2.56- 3.27 | 3.01 |
| Repairs..... | 2.97- 8.26 | 5.11 | 1.79- 6.64 | 3.84 | 1.87- 5.67 | 3.92 | 2.75- 7.81 | 4.25 | 1.79- 8.26 | 4.23 |
| Miscellaneous..... | 1.28- 5.80 | 2.24 | 1.15- 7.66 | 3.06 | 1.47- 5.00 | 2.28 | 1.16- 3.25 | 1.72 | 1.15- 7.66 | 2.35 |
| Out-of-pocket | | | | | | | | | | |
| subtotal 4/..... | 18.86-30.89 | 22.70 | 15.73-31.32 | 20.55 | 15.98-23.83 | 19.08 | 14.90-27.24 | 18.02 | 14.90-31.32 | 20.01 |
| Depreciation..... | .98- 4.80 | 3.09 | .82- 4.74 | 2.15 | 1.86- 8.96 | 4.06 | 2.53-12.85 | 4.04 | .82-12.85 | 3.37 |
| Interest..... | 0 - 5.09 | 1.05 | 0 - 5.36 | .59 | 0 - 2.76 | .73 | 0 - 1.13 | .34 | 0 - 5.36 | .68 |
| Total..... | 21.26-35.19 | 26.84 | 16.55-32.81 | 23.29 | 19.96-34.27 | 23.88 | 17.71-41.22 | 22.41 | 16.55-41.22 | 24.07 |
| Standardized | | | | | | | | | | |
| depreciation 5/..... | 2.42- 5.91 | 3.60 | 2.01- 6.33 | 3.62 | 2.49- 8.43 | 4.40 | 3.31-15.89 | 5.07 | 2.01-15.89 | 4.17 |
| Standardized | | | | | | | | | | |
| interest 5/..... | 1.55- 3.93 | 2.34 | 1.39- 4.19 | 2.39 | 1.71- 5.22 | 2.73 | 2.01- 9.77 | 3.10 | 1.39- 9.77 | 2.64 |
| Total | | | | | | | | | | |
| standardized 6/..... | 24.07-40.73 | 28.63 | 21.21-41.84 | 26.56 | 22.49-37.48 | 26.21 | 20.22-52.90 | 26.19 | 20.22-52.90 | 26.82 |

1/ Group 1--8 bales or less; group 2--9 to 11 bales; group 3--12 to 20 bales; and group 4--21 bales or more per hour rated ginning capacity. See weighting procedure for "all groups combined" in appendix.

2/ Taken from gin records and subjected to uniform allocation procedures as outlined in appendix.

3/ Low and high values shown for individual cost items indicate ranges observed among sample gins in a size group. Since the same gin plant was not consistently lowest or highest for all cost items, sums of individual costs will not add to totals shown.

4/ Sample gin cost excluding depreciation and interest.

5/ Sample gin costs from which effects of variations in rates used in computing depreciation and interest have been eliminated--see appendix.

6/ Out-of-pocket costs plus standardized depreciation and interest costs.

Note: The sum of individual average costs may not always equal the totals due to rounding.

with last season, average out-of-pocket costs in 1970-71 were lower in all size groups, ranging from \$0.07 less per bale for group 1 to \$4.69 less for group 2; these two showed the smallest and largest increases in average rates of capacity utilization. The average drop in out-of-pocket costs from 1969-70 to 1970-71 was \$1.65 per bale for all groups combined.

For all groups combined, individual items making up out-of-pocket costs were all lower in 1970-71 than in 1969-70, except for bagging and ties which remained the same for both years. Labor had the greatest drop in average cost from the previous season, followed by management, repairs, and miscellaneous, in that order. Decreases in these four items amounted to \$0.54, \$0.39, \$0.25, and \$0.21 per bale. Regardless of costing method used, group 4 averaged the lowest cost, even though plants in this group operated at the lowest average rate of capacity utilization.

Cost per bale at 70-percent capacity utilization.--To allow cost comparisons at the same relative ginning volume levels, group average costs were adjusted to a uniform rate of 70-percent capacity utilization (table 4). 5/ This adjustment lowered costs per bale substantially for all groups, pointing up the beneficial effect of increased volumes on unit operating costs regardless of plant size (tables 2, 3, and 4). The actual cost advantages of group 4 over other groups (table 3) were further increased with the introduction of uniform rates of capacity utilization. This supports the theory that economies of scale are available in large-size plants if ginning volumes are large enough to ensure relatively high rates of capacity utilization. Compared with 1969-70, adjusted costs were higher in group 1, but lower in all other size categories except group 4 standardized total. For all groups combined, at 70-percent capacity use, costs for management, insurance, taxes, standardized depreciation, and standardized interests 6/ increased in 1970-71 over 1969-70; costs for bagging and ties remained the same; and all other costs showed small decreases.

5/ See Cost Adjustments in appendix.

6/ Standardized interest cost per bale was \$0.28 higher. However, \$0.23 of the cost increase was due to a change in the standardized interest rate from 7 to 8 percent.

Table 4.--Estimated sample gin costs per bale at 70-percent capacity utilization, 1/ groups 1-4 and all groups combined, 2/ West Texas, 1969-70 and 1970-71 seasons

| Cost items 3/ | 1969-70 | | | | | | | | | | 1970-71 | | | | | | | | | |
|----------------------------------|----------------|-------|-------|-------|---------------------|-------|-------|-------|-------|---------------------|----------------|-------|-------|-------|---------------------|-------|-------|-------|-------|---------------------|
| | Gin size group | | | | | | | | | | Gin size group | | | | | | | | | |
| | 1 | 2 | 3 | 4 | All groups combined | 1 | 2 | 3 | 4 | All groups combined | 1 | 2 | 3 | 4 | All groups combined | 1 | 2 | 3 | 4 | All groups combined |
| | Dollars | | | | | | | | | | Dollars | | | | | | | | | |
| Management..... | 3.26 | 2.78 | 2.14 | 1.59 | 2.37 | 3.30 | 2.92 | 2.21 | 1.61 | 2.45 | 2.92 | 2.21 | 1.61 | 2.45 | 2.92 | 2.21 | 1.61 | 2.45 | 2.92 | 2.21 |
| Insurance..... | .38 | .20 | .22 | .20 | .24 | .36 | .27 | .31 | .23 | .29 | .36 | .27 | .31 | .23 | .29 | .36 | .27 | .31 | .23 | .29 |
| Taxes..... | .35 | .25 | .19 | .23 | .25 | .34 | .29 | .20 | .24 | .26 | .34 | .29 | .20 | .24 | .26 | .34 | .29 | .20 | .24 | .26 |
| Energy..... | 1.88 | 1.57 | 1.92 | 1.72 | 1.77 | 1.79 | 1.55 | 1.86 | 1.64 | 1.72 | 1.79 | 1.55 | 1.86 | 1.64 | 1.72 | 1.79 | 1.55 | 1.86 | 1.64 | 1.72 |
| Labor..... | 5.17 | 3.72 | 4.03 | 3.41 | 4.01 | 5.27 | 3.95 | 3.65 | 3.13 | 3.90 | 5.27 | 3.95 | 3.65 | 3.13 | 3.90 | 5.27 | 3.95 | 3.65 | 3.13 | 3.90 |
| Bagging and ties..... | 3.08 | 2.97 | 3.04 | 2.94 | 3.01 | 2.96 | 2.92 | 3.09 | 3.07 | 3.01 | 2.96 | 2.92 | 3.09 | 3.07 | 3.01 | 2.96 | 2.92 | 3.09 | 3.07 | 3.01 |
| Repairs..... | 4.59 | 4.94 | 3.84 | 4.20 | 4.35 | 4.96 | 3.79 | 3.67 | 4.18 | 4.06 | 4.96 | 3.79 | 3.67 | 4.18 | 4.06 | 4.96 | 3.79 | 3.67 | 4.18 | 4.06 |
| Miscellaneous..... | 2.24 | 3.96 | 2.36 | 1.57 | 2.54 | 2.57 | 3.35 | 2.18 | 1.69 | 2.43 | 2.57 | 3.35 | 2.18 | 1.69 | 2.43 | 2.57 | 3.35 | 2.18 | 1.69 | 2.43 |
| Out-of-pocket subtotal 4/..... | 20.95 | 20.39 | 17.74 | 15.86 | 18.54 | 21.55 | 19.04 | 17.17 | 15.79 | 18.12 | 21.55 | 19.04 | 17.17 | 15.79 | 18.12 | 21.55 | 19.04 | 17.17 | 15.79 | 18.12 |
| Depreciation..... | 2.81 | 1.53 | 2.94 | 2.67 | 2.49 | 2.61 | 1.52 | 2.90 | 2.51 | 2.41 | 2.61 | 1.52 | 2.90 | 2.51 | 2.41 | 2.61 | 1.52 | 2.90 | 2.51 | 2.41 |
| Interest..... | 1.06 | .36 | .55 | .20 | .51 | .89 | .42 | .52 | .21 | .49 | .89 | .42 | .52 | .21 | .49 | .89 | .42 | .52 | .21 | .49 |
| Total..... | 24.82 | 22.28 | 21.23 | 18.73 | 21.54 | 25.04 | 20.99 | 20.59 | 18.51 | 21.01 | 25.04 | 20.99 | 20.59 | 18.51 | 21.01 | 25.04 | 20.99 | 20.59 | 18.51 | 21.01 |
| Standardized depreciation 5/.... | 2.99 | 2.51 | 3.05 | 2.97 | 2.88 | 3.03 | 2.57 | 3.14 | 3.15 | 2.98 | 3.03 | 2.57 | 3.14 | 3.15 | 2.98 | 3.03 | 2.57 | 3.14 | 3.15 | 2.98 |
| Standardized interest 5/..... | 1.70 | 1.45 | 1.65 | 1.61 | 1.60 | 1.97 | 1.69 | 1.95 | 1.93 | 1.88 | 1.97 | 1.69 | 1.95 | 1.93 | 1.88 | 1.97 | 1.69 | 1.95 | 1.93 | 1.88 |
| Total standardized 6/..... | 25.64 | 24.35 | 22.44 | 20.44 | 23.02 | 26.54 | 23.30 | 22.26 | 20.86 | 22.97 | 26.54 | 23.30 | 22.26 | 20.86 | 22.97 | 26.54 | 23.30 | 22.26 | 20.86 | 22.97 |

1/ See cost adjustments in appendix.

2/ Group 1--8 bales or less; group 2--9 to 11 bales; group 3--12 to 20 bales; and group 4--21 bales or more per hour rated ginning capacity. See weighting procedure for "all groups combined" in appendix.

3/ Taken from gin records and subjected to uniform allocation procedures as outlined in appendix.

4/ Sample gin cost excluding depreciation and interest.

5/ Sample gin costs from which effects of variations in rates used in computing depreciation and interest have been eliminated--see appendix.

6/ Out-of-pocket costs plus standardized depreciation and standardized interest costs.

Note: The sum of individual costs may not always equal the totals due to rounding.

APPENDIX: METHODOLOGY

Gins vary widely by type of organization, ownership structure, accounting procedures used, and in many other ways. In analyzing costs reported by sample gins, uniform allocation procedures were employed to compensate for some of these differences.

Costs of hauling cottonseed and lint--such as truck drivers' wages, truck depreciation, insurance, road-use taxes, and associated truck-operating costs--were excluded.

Cost Allocations

Management: Where applicable, includes salaries, bonuses, commissions, expense allowance, house rent, and personal insurance policies for owners and managers; bookkeeping and other office salaries, home office (line companies); social security taxes, workmen's compensation insurance, and any other insurance on management and office personnel.

Depreciation: Includes allowances for depreciation exactly as carried on gin records except under standardized and out-of-pocket costs.

Interest: Includes interest exactly as carried on gin records except under standardized and out-of-pocket costs.

Insurance: Includes cost of all forms of insurance on gin buildings, equipment, housing furnished management and labor, cotton products, and automotive equipment (except large trucks and trailers). 111

Taxes: Includes all taxes on real property only.

Energy: Includes cost of all utilities--electricity, gas, and water--used in ginning and directly related operations.

Labor: Includes cost of gin wages, social security, workmen's compensation, and any other insurance of gin labor borne by the gin; plus any rental housing furnished labor (excludes gin repair labor; see "Repairs" below).

Bagging and ties: Includes actual cost of bagging and ties purchased.

Repairs: Includes cost of gin repair wages, social security, workmen's compensation, and other insurance on gin repair labor borne by the gin; plus the the cost of repair materials and supplies.

Miscellaneous: Includes cost of combined car and pickup, tractor, and other automotive outlays; telephone and telegraph; advertising and promotion; legal and audit; dues, memberships, and subscriptions; annual meetings and directors' fees and expense; conventions and travel expenses; donations and contributions; cotton losses from fire; sampling, compressing, and related charges; gin and office supplies; and any other costs not included elsewhere.

Costing Methods

Sample gin costs: Gin costs which have been subjected to the above allocations are identified in this report as sample gin costs.

Standardized sample gin costs: Sample gin costs from which the effects of variations in rates used in computing depreciation and interest have been eliminated by adopting uniform rates. Depreciation was set at 7 percent of the initial purchase price of capital items carried on the depreciation schedule regardless of age or former method of depreciation. Standardized depreciation costs shown in this report for 1969-70 are approximately 30 percent lower than those shown in Cotton Gin Operating Costs in West Texas--1969-70 (U.S. Dept. Agr. Mktg. Res. Rpt. No. 934), owing to a change in the standardized depreciation rate from 10 percent to 7 percent. This change was made to better reflect the useful life of ginning equipment and to be more compatible with rates used in similar ginning cost studies on other production areas. For 1970-71, interest was charged at 8 percent on the estimated average gin site land values for the general area and 8 percent on one-half the cost of buildings, machinery, and equipment. For 1969-70, an interest rate of 7 percent was used in both cases.

Out-of-pocket costs: Sample gin costs from which depreciation and interest have been excluded.

Cost Adjustments

Estimates of ginning costs at other than existing levels of capacity utilization were based on relationships obtained from a recent study of model gins: Looney, Zolon M., and Wilmot, Charles A., Economic Models for Cotton Ginning, U.S. Dept. Agr., Agr. Econ. Rept. 214, Oct. 1971.

Weighting

In computing per bale cost averages for all groups combined, the simple weighted average for each group was further weighted by its representative proportion of the total rated hourly ginning capacity in West Texas. This was done to reflect more accurately the cost of ginning an "average" bale of cotton in West Texas.

